QUALITY ASSURANCE PROVISIONS (QAP)
FOR THE
FIN, ASSEMBLY, CONICAL
MK 83 MOD 1

I. QUALITY SYSTEM REQUIREMENTS

A. The contractor shall implement and maintain a quality system meeting the requirements of ISO 9002-1994 (or 9001-2000.) The quality system shall also implement the following provisions:
   1. Subcontractors producing CRITICAL and/or MAJOR characteristics shall have a quality system compliant to ISO 9002-1994 (or 9001-2000.)
   2. When property is furnished by the government, the contractor shall implement the following:
      (a) Examination upon receipt, consistent with practicality, to detect damage upon transit;
      (b) Inspection for completeness, quantity and proper type;
      (c) Periodic inspection and precautions to assure adequate storage conditions and to guard against damage from handling and deterioration during storage;
      (d) Identification and protection from improper use or disposition.
   3. Process and Production Control conditions shall include:
      (a) Documented manufacturing planning for the implementation and control of manufacturing operations. The planning shall include: a description of operations, facility, environmental equipment, and tooling requirements, associated controls, and a process flow chart to portray the process of fabrication and assembly in terms of key operations.
      (b) Accountability for all product.
      (c) Evidence that all manufacturing, test, and inspection operations have been completed in sequence, as planned, or as otherwise documented and authorized.
      (d) Preparation of documented process monitoring, accountability, and operator instructions for all processes that affect product quality. These instructions are to be accessible at the point where work is performed and shall, as a minimum, contain reference to the following: workmanship standards, manufacturing aids, step by step instructions for performing operations, equipment or tools required, special conditions to be maintained, identification of special handling devices, and methods for recording completion of operations.
   4. The contractor's calibration system shall be in accordance with ANSI/NCSL Z540-1-1994.
   5. Control of nonconforming material shall include:
      (a) Controls applied to suspect product as well as to nonconforming product.
      (b) The proposed use or repair of product which does not conform to specified requirements shall be submitted to the government prior to use or repair. Rework and repair shall be in accordance with applicable contract clause. Repetitive nonconformances will not be approved.
      (c) The contractor shall promptly notify the government when a nonconformance is found in the contractor's processes or products that may affect product already delivered.
   6. Corrective action shall be required of a subcontractor when it is determined that the root cause of a nonconformity is the responsibility of the subcontractor.

7. Internal audits shall cover all quality management related processes, activities, and shifts, and shall be scheduled according to an annual plan.

B. The quality system shall be documented in a Quality System Plan (QSP) in accordance with the applicable CDRL, ADL, SOW, and this QAP. The QSP shall document the details of the contractor's quality system, including management commitment to quality, system elements, policy and practices. This Plan provides the government a basis for assessment of the quality system and evidence of the contractor's intent to comply with the contract quality requirements.
   1. The QSP shall include traceability from the specific quality requirement elements to the specific contractor processes which support those elements. The QSP shall include:
      (a) A summary of the contract quality requirements and
      (b) A relational matrix to indicate the general relationship between the contractor's quality system procedures/processes and the applicable quality system elements. The matrix, or an attachment thereto, shall also identify schedules or quality activities and tasks which must be coordinated and compatible with other schedules prepared for work under the contract, as well as include the name(s) of the person(s) responsible for accomplishments of activities and tasks.
   2. The QSP shall identify the means by which the contractor will ensure quality system effectiveness and demonstrate comprehensive management and review of data, such that the results may be used to indicate trends and progress in quality of design, processes fabrication, assembly, test and acceptance as appropriate to the contract. The QSP shall describe what is measured, how often it is tracked, and who reviews and assures that appropriate action is initiated when trends are unfavorable.
   3. A copy of the contractor's quality manual which describes the current quality system shall be attached.

II. INSPECTION REQUIREMENTS

A. Contractor, in performing sampling inspection of the product(s) being manufactured/delivered under this contract, shall, as a minimum, comply with the sampling inspection requirements of MIL-STD-1916, as set forth below, without jeopardizing quality:
   1. Characteristics classified on the drawings or in separate documents as CRITICAL shall be inspected 100%.
   2. Characteristics classified on the drawings or in separate documents as MAJOR shall be inspected by characteristic using MIL-STD-1916, Verification Level (VL)-IV.
   3. Characteristics classified on the drawings or in separate documents as MINOR either listed or unlisted shall be inspected by characteristic using MIL-STD-1916, VL-II.

NOTES:
1. The above criteria will apply except where sampling plans and acceptance criteria appear in the product and/or affiliated specifications, or where authorization to deviate from the requirements of this clause has been obtained in accordance with contract requirements.
2. MIL-STD-1916 will form the basis of the sampling inspection program. Those elements of MIL-STD-1916 related to sampling inspection will also apply (e.g., switching rules, non conformance disposition, etc.) Reduction of test and inspection requirements will be as defined elsewhere in the QAP and contract.

3. MIL-STD-1916 is not intended for use with destructive testing. Should sampling with destructive testing be required, an accompanying sampling plan will be provided in the technical documentation.
4. If the use of an alternate sampling plan (other than those specified above) is desired, it shall be documented in detail to show factors such as lot size, sample size, acceptance criteria, and operating characteristic curves, and submitted for approval in accordance with the contract requirements.
5. Characteristics other than product attributes-processing requirements specified on drawings which are classified as CRITICAL, MAJOR, MINOR, or unclassified are exempt from the inspection requirements of the plans above. However, these processes shall be controlled in accordance with the quality system requirements of the QAP and contract.

B. The contractor shall prepare an Acceptance Inspection and Test Plan (ITP) in accordance with the following format. The ITP shall be submitted as part of the QSP in accordance with the applicable CDRL.
   1. General format: The ITP shall, at minimum, contain the following:
      (a) Cover sheet identifying item, contract number, and revision letter of the plan.
      (b) All of the tests and inspections required for acceptance of the item, documented in accordance with the requirements herein.
      (c) A section for gage and measurement equipment maintenance, recertification, and recalibration documented in accordance with the requirements herein.
   2. Format for documenting inspections: For each test or inspection, including those tests or inspections which are contained in specifications, specific instructions shall be prepared and shall contain the following:
      (a) Identification of the item to be tested or inspected, including part number, revision letter, and nomenclature.
      (b) Identification of measuring and test equipment using appropriate identification data which is visible on the equipment. Standard instruments such as a caliper or micrometer do not require a one to one identification description and can be identified simply as "caliper" or "micrometer".
      (c) The location of the characteristic, such as the drawing sheet and zone, or a brief description of the characteristic such that an inspector can identify it's location.
      (d) A written procedure for performing the test or measurement when the characteristic is other than a simple plus or minus tolerance dimension which is measured by the use of a standard instrument such as a caliper or micrometer. The procedure may be placed in an appendix of the plan and referenced if the procedure is lengthy or repeatedly used.
      (e) The manner in which the result of the inspection is to be recorded such as a particular data sheet.
      (f) Criteria for passing or failing the inspection (such as the high and low limit for a particular dimension, a particular minimum tensile strength, minimum voltage, etc.).
      (g) Details of the sampling plan to be used.

   3. Format for gage maintenance, recertification, and recalibration schedule: For each acceptance gage, or other measurement device (including standard measuring instruments) used for final acceptance, the following information shall be documented in the ITP:

(a) A description of the gage or measuring device, including identification data which is visible on the equipment.
(b) A schedule for recertification of the gage or measurement device in terms of gage passes or time limit.
(c) Inspection and test equipment used for acceptance of CRITICAL and MAJOR characteristics shall require design approval in accordance with applicable CDRL. A copy of the approval shall be included. Inspection and test equipment used for acceptance of other characteristics (i.e., MINOR) shall require approval in accordance with applicable CDRL. A copy of the approval shall be included.

The above format shall be used for all required tests and inspections regardless of whether the tests or inspections are performed by a subcontractor. When tests or inspections are performed by a subcontractor, all of the above information shall be provided by the subcontractor or obtained by subsequent receipt test or inspection or final acceptance by the prime contractor. When tests or inspections are performed by a subcontractor, the prime contractor shall review the relevant specifications and create a receipt test or inspection review sheet to review the subcontractor's test and inspection data to ensure conformity to contractual requirements. In-process or statistical production tests or inspections, which are used for purposes of manufacturing material, which will later be verified by an acceptance test or inspection, need not be documented in the plan.

C. Approved test and inspection equipment shall be made available for use by the government when required to determine conformance with contract requirements. If conditions warrant, contractor personnel shall be made available for operation of such devices and for verification of their accuracy and condition.

III. ACCEPTANCE REQUIREMENTS

A. First article and production acceptance tests are required and shall be performed as specified in SOW 923AS400.

B. At conclusion of First Article and Lot Acceptance Testing, the contractor shall prepare test reports in accordance with CDRL requirements.

C. A quality system review concurrent with first article test/inspection or first lot acceptance test may be conducted to evaluate the contractor's processes and procedures inherent to the quality of items to be delivered under this contract. The review shall be conducted by government representatives designated by the PCO.

IV. STATISTICAL PROCESS CONTROL PROGRAM

A. The contractor shall develop and implement a statistical process control (SPC) program for selected processes, following the guidance and definitions of recognized statistical process control documentation (e.g., IPC-9191) to monitor and reduce process variation and establish process capability. Selected processes shall include, as a minimum, those contributing to the quality of product critical and major characteristics. Evaluation shall be performed to determine and document the relationship of process parameters to the product characteristics. Evidence of process and product variation shall be documented

using appropriate control charts. These charts shall be analyzed in real time. Once control limits are established, they shall be recalculated whenever substantial changes in the process are evident. When a plotted point for a characteristic falls outside the control limits, sources of variation, including special and common causes and gage accuracy and repeatability, shall be identified and minimized. Once SPC has been established, the process capability or potential index (CP) shall be determined. Action plans shall be implemented to reduce variation and improve each process with a current process performance index (CPk) of less than 1.33.

B. The contractor's implementation of the SPC program shall be documented in accordance with the applicable CDRL and contract clauses (with scope of work).

V. INSPECTION AND TEST REDUCTION OR ELIMINATION

A. The government will consider reduction or elimination of selected acceptance test or inspection based upon first article, preproduction, and lot acceptance test results when supported by evidence of both process stability and capability. Contractor written requests shall be made through the Administrative Contracting Officer to the PCO. Approval will be based upon the contractor's quality system plan, statistical process control plan, and validation of the implementation of statistical process control techniques and corresponding results. Upon approval by the PCO, acceptance shall be based upon the approved contractor's statistical process control program and associated statistical techniques.

B. The government will not consider requests for reduction or elimination of 100% acceptance inspection and testing of parameters or characteristics identified as CRITICAL.

C. The government will consider reduction or elimination of acceptance inspection or test requirements when the following conditions are satisfied:
   1. For parameters and characteristics other than CRITICAL when evidence is provided of statistical control and a Cpk of at least 1.33.
   2. Objective evidence that statistical control and Cpk continue to be evaluated and maintained.

D. Evidence of loss of statistical control or degradation below a Cpk of 1.33 shall require immediate corrective action in accordance with the statistical process control program.

E. Any break in production greater than 90 days shall require a return to normal acceptance inspection and testing.

VI. MAINTAINING PLANS

Plans (e.g., Quality System/ITP, SPC) shall be maintained and updated as necessary. All updates (changes/revisions) shall consist of notes or changes to the plan(s), clearly identified as to where applicable (i.e., system element page, paragraph number, etc.). All updates shall be submitted in accordance with CDRL requirements.